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标题: Observation of Dynamic Interactions between Fundamental and Second-Harmonic Modes in a High-Power Sub-Terahertz Gyrotron Operating in Regimes of Soft and Hard Self-Excitation
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摘要: Dynamic mode interaction between fundamental and second-harmonic modes has been observed in high-power sub-terahertz gyrotrons [T. Notake et al., Phys. Rev. Lett. 103, 225002 (2009); T. Saito et al. Phys. Plasmas 19, 063106 (2012)]. Interaction takes place between a parasitic fundamental or first-harmonic (FH) mode and an operating second-harmonic (SH) mode, as well as among SH modes. In particular, nonlinear excitation of the parasitic FH mode in the hard self-excitation regime with assistance of a SH mode in the soft self-excitation regime was clearly observed. Moreover, both cases of stable two-mode oscillation and oscillation of the FH mode only were observed. These observations and theoretical analyses of the dynamic behavior of the mode interaction verify the nonlinear hard self-excitation of the FH mode.
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